

THE KAHN PRECIPITATION TEST*

COMPARED WITH THE KOLMER MODIFICATION OF
THE WASSERMANN TEST IN UNTREATED
PRIMARY DARKFIELD POSITIVE
SERONEGATIVE SYPHILIS

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DISCUSSION by Newton Evans, M. D., Los Angeles;
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A TECHNICAL performance, regardless of its application, must of necessity depend for its interpretation in part upon a variable personal equation. The following statistical data is presented with this factor firmly in mind and in no way are the results interpreted as conclusive or final. Rather a repetition of this investigation is strongly urged that comparative figures may be offered to corroborate what appears to be an important serologic variation.

EARLY DIAGNOSIS IMPORTANT

We have come to appreciate that the early diagnosis and early treatment of syphilis are of paramount importance and that a matter of days or hours may affect the ultimate possibility of clinical and serologic cure in definite percentage figures. This fact was emphasized recently by Chargin and Stone,¹ who quoted 90 per cent of clinical and serological cures for seronegative primary syphilis and 61 per cent for the seropositive group. A difference of about 30 per cent. If the difference between 90 and 61 per cent can represent failure in the cure of the disease through inability to arrive at an early diagnosis, surely then any effort to further simplify or interpret methods should indeed be acceptable.

Two of the most widely accepted serologic methods for the interpretation of the disease are the Kolmer modification of the Wassermann test and the Kahn precipitation test. This communication deals with a comparison of these two tests in primary darkfield positive seronegative syphilis. The increasing dependence placed upon this latter test prompted the investigation. If the previous figures are correct the constant tendency of one test to lag behind the other would obviously affect

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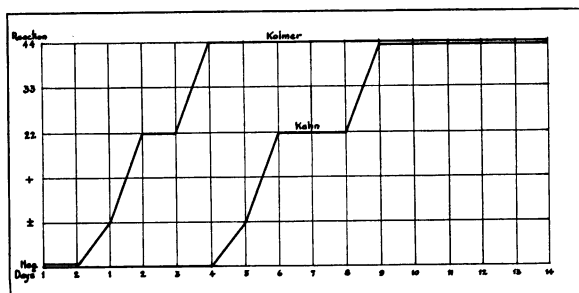


Fig. 1.—Average comparison.

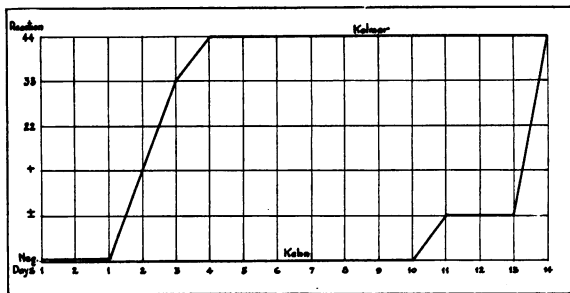


Fig. 2.—Comparison showing the longest time relation.

early diagnosis and in turn lower curative opportunities.

HOW CLINICAL MATERIAL WAS SEGREGATED

Patients presenting primary lesions of syphilis were isolated following darkfield identification of the disease on two or more examinations. Blood samples were drawn daily, divided into six tubes, two tubes sent to each of three laboratories. All specimens were tested in our own laboratory, whereas specimens to the check laboratories were divided. This offered a variety of techniques which allowed for a more accurate interpretation of results.

The daily sera of twenty-five patients with primary darkfield positive seronegative syphilis were examined by the two methods and compared.

INTERPRETATION OF ILLUSTRATIONS

Figure 1 represents an average comparison of the twenty-five cases. The Kolmer preceded the Kahn in the first evidence of positivity by five days. The reaction here ranged from zero to 25 per cent inhibition or precipitation. The diagnostic value of such reactions is obviously not dependable, further serologic evidence of syphilis usually being required before the presence of the disease can be assumed. The Kolmer, however, preceded the Kahn at the level of 50 per cent inhibition and precipitation by five days and for total inhibition and precipitation by six days.

Figure 2 shows a single case which evidenced the greatest time intervals between positive reactions. Here the Kolmer preceded the Kahn in 1 to 25 per cent inhibition and precipitation by ten days, 50 per cent inhibition and precipitation by fourteen days, and total inhibition and precipitation by thirteen days.

Figure 3 represents an isolated example of the shortest time interval between positive reactions.

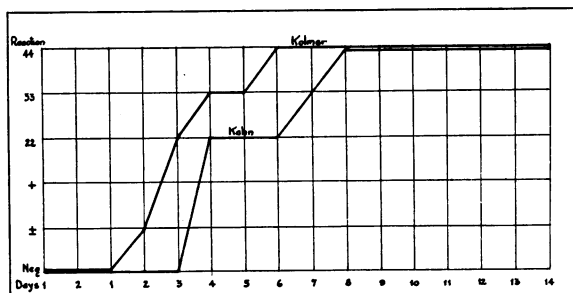


Fig. 3.—Comparison showing the shortest time relation.

Here the Kolmer preceded the Kahn in 1 to 25 per cent inhibition and precipitation by two days, 50 per cent by one day, and total precipitation and inhibition by three days.

COMMENTS

There appeared to be a consistent relation between the two tests and the duration of infection. Those patients having a duration of infection of three weeks evidenced the least variation, while those with infections of eight weeks' duration showed the greatest variation (Figure 4). The duration of infection up to the first evidence of serologic positivity ranged from eighteen to fifty-seven days, with an average of forty-one days.

Secondary cutaneous manifestations developed in 60 per cent of the cases. It is interesting to note that in 88 per cent of this group the secondary lesions appeared almost simultaneously with the strongly positive Kahn. The remaining 12 per cent of cases developed secondary cutaneous lesions two to four days after the appearance of the strongly positive Kahn.

The obvious question in such a serologic investigation centers about the sensitivity of the two tests. It is highly possible to have a hypersensitive Kolmer and a less sensitive Kahn, which combination could easily result in the data just presented.[†] One of the two laboratories checking the sera agreed in the Kolmer, but evidenced a less sensitive Kahn. The third laboratory evidenced both a less sensitive Kolmer and a less sensitive Kahn. Positivity appeared in both tests four to five days later than our own. In both checks the Kahn test was less sensitive than our own, the Kolmer equal in one and less sensitive in the other.

That either the Kolmer or Kahn tests were oversensitive would appear improbable, for periods of absolute negativity preceded all of the studied cases by three to eighteen days and in no instance were humps (positive, then back to negative) noted prior to the ascending and consistent positivity. The tests appeared progressively positive from day to day.

Approximately one hundred and fifty blood samples are tested from the department of dermatology and syphilology each month. All patients, referred to the department in the event of a positive blood Wassermann reaction identified by routine serologic tests in the hospital, were in every instance corroborated by repeated positive serology, clinical evidence, and previous histories of infection with subsequent treatment for syphilis.

The comparison of the Kolmer and Kahn tests on all blood samples so tested in the hospital was reported by Evans in 1929. He recorded complete agreement in 96.71 per cent, relative agreement in 1.18 per cent, and complete disagreement in 2.1 per cent. A similar comparison in the same laboratory from 1929 to the present shows complete agreement in 96.25 per cent, relative agreement in 2.25 per cent, and disagreement in 1.5 per

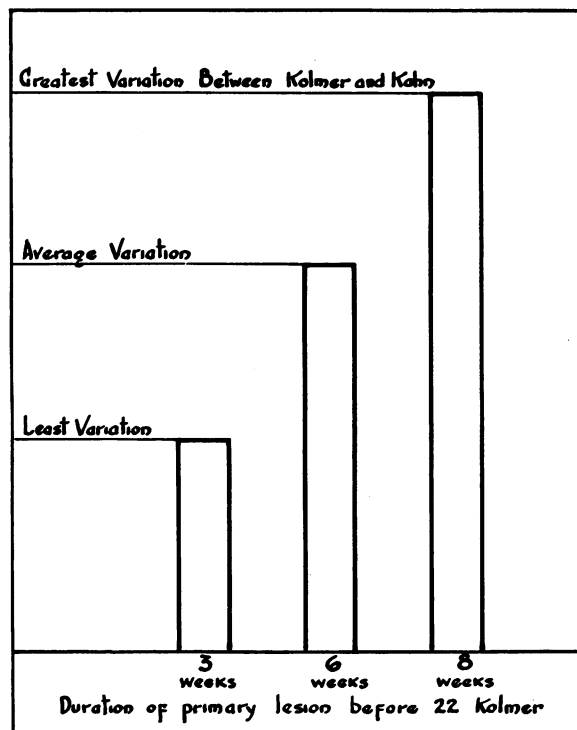


Fig. 4.—Showing relation between the variation of tests and the duration of infection.

cent. These figures agree quite accurately with most previous authors and help to establish our serological procedures as probably accurate. The high percentage of agreement is indeed favorable in further establishing the accuracy of our present comparative figures.

A third and most important factor in the explanation of possible variation is the Kahn antigen. During the investigation three different manufactured antigens were tested. A marked difference in sensitivity was apparent although all were supposedly standardized. Two of the antigens were sufficiently unsatisfactory to warrant their discontinuance, since evidence of such variation was apparent.

The presumptive Kahn test, using a more sensitive Kahn antigen, was used in but two cases. The comparative results, however, were the same, suggesting a fixed point in the appearance of the positive reaction regardless of antigen sensitivity.

CONCLUSIONS

To determine that serologic test which was able to identify a syphilitic infection in its earliest stage seemed of sufficient importance to warrant the investigation contained herein. The results are obviously not conclusive and do not permit the inference of advantage or advisability of one test over the other. It would indeed be helpful if at intervals such material could be utilized to act as a check on the serologic procedures of all laboratories.

In view of the many sources of error, it is to be hoped that this material will not act to unjustly affect a test which has proved one of the greatest aids to modern medicine.

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[†] The tests were done by Mrs. Chestnut, in charge of the serologic laboratory of the Los Angeles County General Hospital.

REFERENCE

1. Chargin, L., and Stone, A.: *Arch. Dermat. and Syph.*, 19:750 (May), 1929.

DISCUSSION

NEWTON EVANS, M. D. (White Memorial Hospital, Los Angeles).—Doctor Chambers' communication presents a significant clinical experimental observation. It has a practical bearing on the treatment of syphilis. To know that the Kolmer test will enable the physician to recognize serologically the presence of a primary infection on an average of four days earlier than it can be detected by the Kahn test, is of definite importance in the institution of treatment.

To the student of serology, it opens the way for speculation on the nature of the specific antibodies concerned in the serologic tests for syphilis. In the laboratory of the Los Angeles County General Hospital, observations on approximately ninety thousand parallel Wassermann and Kahn tests have made it clear that there is no close parallelism between the two tests. While there is complete agreement within the limits of the ordinary reading in 96 per cent of specimens, there is a limited group of cases in which there is a constant complete disagreement. Some sera are Kahn-positive four plus with negative Wassermann, and others give exactly opposite reactions. This discrepancy is not due to mistakes in the technique or reading, but is a constant difference proved by many repetitions. This observation is in harmony with numerous large series of observations in other laboratories.

One cannot escape the conclusion that there must be an essential difference in the character of the substance or substances in the serum responsible for the reaction with the antigen in the two tests. Doctor Chambers' observation of the constant difference in date of appearance of positivity of the two tests is strong confirmation of this viewpoint.

On the contrary, men who have made an extensive study of these serologic tests hold a different opinion. Doctor Kolmer has stated: "I have conducted considerable investigation and the results have convinced me that precipitin and complement fixation antibodies are either identical or so closely associated in the phenomenon of complement fixation as to demand the presence of both for the reaction. I believe they are identical or very closely related." But he admits that conclusive evidence of their unity has not been produced. Doctor Kahn expresses a similar opinion and quotes Dean to the effect that precipitin (of the Kahn test) and amboceptor (of the Wassermann test) are the same substance.

Assuming the validity of Doctor Chambers' observation, one must conclude that in the two tests either the nature of the reacting substance or substances in a given syphilitic serum must be in some way different or that the Wassermann (Kolmer modification) test is a more sensitive indicator of the presence of the reacting substance. This latter alternative conclusion appears absurd in view of the thousands of dependable tests on syphilitic serum in which the Kahn is four plus positive and the Wassermann completely negative.

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W. T. CUMMINS, M. D. (Southern Pacific General Hospital, San Francisco).—There is an increasingly large number of laboratories that are employing the Kahn technique, either alone or with the Wassermann technique. A comparison of the two tests in the routine examination of many cases has revealed numerous, unexplainably wide differences in results. It has been said that the Kahn test is the more sensitive, especially in eliciting positive reactions during syphilitic treatment.

The author has chosen for his study a very important and practical phase of the subject. The earliest possible diagnosis of syphilis after the appearance of the primary lesion is that which we wish to attain. Negative darkfield results are sometimes followed by positive serologic findings.

With the Kolmer-Wassermann positiveness preceding that of the Kahn by four days, as determined by the author, one might interpret, indeed, such findings by the assumption that the Kahn antigen or antigens were undersensitive. Be that as it may, his results suggest that the complement fixation and the precipitin reactions for syphilis do not elicit the same so-called antibody.

The author has presented a very pertinent contribution and we trust that he may continue the work and that others may be interested, so that an extended investigation will be made in order to facilitate the earliest possible diagnosis of syphilis and, perhaps, to establish the identity or lack of identity of the reacting substances in syphilitic serum.

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H. A. WYCKOFF, M. D. (Stanford-Lane Hospital, San Francisco).—The objective of Doctor Chambers' investigation has most important bearings. The value of his contribution, real as it already is, will be enhanced by further work on his part, and by repetition of his experiments by others. Such substantiation is, of course, indispensable.

The expression of an opinion as to the validity of his findings should probably not be attempted by any but those who have already performed similar investigations or parallel experiments. For this reason it seems probable that the valuation and interpretation made by Doctor Chambers himself deserves most attention.

He has perhaps been somewhat too modest in his estimation of the value of his observations as they at present stand. It must be realized that the ultimate test of the worth of a method to the medical profession must be the result obtained when carefully performed by trained workers under everyday conditions and not in some environment specially created.

Doctor Chambers' clear and concise description of his methods and findings seems to indicate that his investigation has been made with dependable reagents and with adequate control. His results and conclusions have a right to consideration by those qualified to judge.

PARTIAL GASTRIC RESECTION*

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GASTRIC resection was first successfully accomplished by Theodore Billroth in 1881.¹ A few months later the first gastro-enterostomy was done by Wöfler.² Since that time, so thoroughly have the technical barriers been overcome and so well understood are the major indications for gastric surgery that there is now no hesitancy in resorting to surgical procedure. However, there is a striking difference of opinion among our best physicians as to the type of operation to be performed. During the past decade noted European surgeons have constantly recommended partial resection for most gastric lesions, as well as for duodenal ulcers, reporting that the result of this type of operation is much better than that following gastro-enterostomy. This influence has extended to America, where many surgeons cor-

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